

Japanese (PDF)

File Wrapper Information

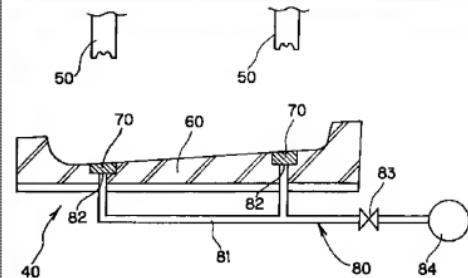
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**FULL CONTENTS CLAIM + DETAILED DESCRIPTION**  
**TECHNICAL FIELD PRIOR ART EFFECT OF THE**  
**INVENTION TECHNICAL PROBLEM MEANS**  
**DESCRIPTION OF DRAWINGS DRAWINGS**

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[Translation done.]

Drawing selection Representative draw



[Translation done.]

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**Notes:**

1. Untranslatable words are replaced with asterisks (\*\* \*\*).
2. Texts in the figures are not translated and shown as it is.

Translated: 03:24:02 JST 04/16/2009

Dictionary: Last updated 04/14/2009 / Priority: 1. Chemistry / 2. Natural sciences / 3. Technical term

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**FULL CONTENTS**

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**[Claim(s)]**

[Claim 1]A boss for supersonic waves (23) who provided in parts (20) of one side is inserted in a mounting hole (32) of parts (30) of the other side, It is an ultrasonic welding method which carries out welding processing of the tip of a boss for supersonic waves (23) by an ultrasonic horn (50), [ by conducting to an aluminum radiator (70) which received heat generated on parts (20) at the time of ultrasonic welding, and was allocated in a jig (60), and cooling this aluminum radiator (70) by a cooling system (80) ] An ultrasonic welding processing method receiving heat accumulated in parts (20) and eliminating outside from the jig (60) side.

[Claim 2]An ultrasonic welding device comprising:

Two or more ultrasonic horns (50) provided by being able to move up and down and being equivalent to an ultrasonic-machining portion.

An aluminum radiator (70) which consists of a receptacle jig (60) which sets parts (20, 30) which are the targets of

ultrasonic machining, and is allocated in a receptacle jig (60) by ultrasonic-machining portion.

A cooling system (80) which cools an aluminum radiator (70).

[Claim 3]The ultrasonic welding device according to claim 2, wherein a cooling system (80) is a discharge method which sprays air for cooling on an aluminum radiator (70) from an air supply pump (84).

[Claim 4]The ultrasonic welding device according to claim 2, wherein a cooling system (80) is a negative pressure method which carries out degasification of the heat of an aluminum radiator (70) outside with a vacuum pump (86).

[Claim 5]The ultrasonic welding device according to claim 2 performing a cooling system (80) by making a radiator of an aluminum radiator (70) face in a refrigerant passage (90) of a medium for cooling.

[Claim 6]The ultrasonic welding device according to claim 5, wherein a radiator formed in an aluminum radiator (70) is a fin for heat dissipation (73).

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#### [Detailed Description of the Invention]

[0001]

[Field of the Invention]This invention relates to an ultrasonic welding method and an ultrasonic welding device, and relates to the ultrasonic welding method and ultrasonic welding device with which a thermal damage is not added in particular to the product surface in a welding spot.

[0002]

[Description of the Prior Art]For example, as shown in drawing 12, the door trim 1 by which interior is carried out to the door panel of vehicles comprises a layered product of the core material 2 fabricated by desired curved surface shape and the epidermis material 3 stuck on the surface. And the armrest 4 is formed in the center of the door trim 1 so that a crew member may hang and rest an elbow. The pull handle 5 is attached to this armrest 4, this pull handle 5 is operated to it, and the door is opened and closed to it.

[0003]Although this armrest 4 and the pull handle 5 are carrying out post-installation processing of what attached the pull handle 5 to the armrest 4 beforehand at the door trim 1, the armrest 4 wraps the surface of the armrest core material 4a entirely with the armrest epidermis 4b, and is constituted.

As shown in drawing 13, ultrasonic welding processing is used for attachment of the pull handle 5 to this armrest 4 in many cases.

[0004]That is, the armrest 4 and the pull handle 5 are set on the receptacle jig 6. At this time, the boss 8 for supersonic waves protrudes on the back of the armrest 4 in the correspondence part of the ultrasonic horn 7, This boss 8 for supersonic waves is intercalated into the mounting hole 5b provided in the flange 5a of the pull handle 5, The pull handle 5 is attached to the armrest 4 by adding vibration, putting specified pressure for the tip of the boss 8 for supersonic waves by the ultrasonic horn 7, making the tip of the boss 8 for supersonic waves into a molten state, and crimping it.

[0005]

[Problem to be solved by the invention]Thus. [ the conventional method of using an ultrasonic welding device and attaching the pull handle 5 to the armrest 4 ] The heat generated at the time of ultrasonic welding processing is added to the product surface side, and the armrest epidermis 4b receives a thermal damage, For example, when crossing is used as the armrest epidermis 4b, the fault that carrying out melting to the shape of solid in a welding processing point, and causing albinism etc. reduces the surface appearance of a product remarkably is pointed out.

[0006]Therefore, in order to avoid this thermal damage, shorten ultrasonic welding time, using the crossing of an expensive grade as the armrest epidermis 4b, and are keeping excessive heat from being added in the former, but. In such a case, inviting a cost rise and causing the shortage of welding etc. is the cause of reducing quality performance.

[0007]When this invention was made in view of such a situation and carries out junction immobilization of two or more parts by ultrasonic welding processing, while it abolishes that the thermal damage in an ultrasonic-machining point is added to a product and aims at improvement in appearance performance, [ an invention ] Sufficient welding strength can be secured and, moreover, becoming possible etc. also aims use of the cheap material at providing the high ultrasonic welding method and ultrasonic welding device of practical value.

[0008]

[Means for solving problem][ to achieve the above objects the ultrasonic welding method concerning this invention ] The boss for supersonic waves who provided in the parts of one side is inserted in in the mounting hole of the parts of the other side, [ by being an ultrasonic welding method which carries out welding processing of the tip of the boss for supersonic waves by an ultrasonic horn, conducting to the aluminum radiator which received the heat generated on parts at the time of ultrasonic welding, and was allocated in the jig and cooling this aluminum radiator by a cooling

system] The heat accumulated in parts is received and it eliminates outside from the jig side.

[0009][ the ultrasonic welding device used for this invention method ] It could move up and down, and consisted of a receptacle jig which sets the parts which are two or more ultrasonic horns provided by being equivalent to an ultrasonic-machining portion, and the target of ultrasonic machining, and the receptacle jig was equipped with the cooling system which cools the aluminum radiator allocated by the ultrasonic-machining portion and an aluminum radiator.

[0010]Here, [ as a cooling system which cools an aluminum radiator ] For example, the air for cooling may be sprayed on an aluminum radiator from an air supply pump, and an aluminum radiator may be cooled, and the heat of an aluminum radiator may be attracted by piping for air suction linked to a vacuum pump, and the heat by which accumulation is carried out to the aluminum radiator may be removed outside.

[0011]Form radiators, such as a fin for heat dissipation, in an aluminum radiator, a machine direction makes the refrigerant which goes to the jig exterior face this radiator, and it may be made to eliminate the heat of an aluminum radiator outside.

[0012]And according to this invention, conduct the heat generated on an ultrasonic welding point to the aluminum radiator which received from the product side and was provided in the jig, and an aluminum radiator is heated, but. Since an aluminum radiator is cooled by the cooling system, when the heat by the side of a product flows into the aluminum radiator side one by one, the thermal damage in an ultrasonic welding point is not added to the product surface.

[0013]

[Mode for carrying out the invention]It explains in detail, referring to an accompanying drawing for the embodiment of the ultrasonic welding method concerning this invention, and a welding device hereafter.

[0014]The front view and the sectional view, and drawing 3, in which the door trim for cars provided with the armrest and pull handle which joined drawing 1 and drawing 2 with the application of this invention method is shown are an explanatory view showing the mounting state which attaches a pull handle to an armrest. Drawing 4 and drawing 5 show one embodiment of the ultrasonic welding device concerning this invention, and the explanatory view and drawing 5 which drawing 4 shows the outline composition of an ultrasonic welding device are an explanatory view showing the composition of the receptacle jig in an

ultrasonic welding point.

[0015]The explanatory view in which drawing 6 thru/or drawing 8 showing one embodiment of this invention method, and showing the state where drawing 6 set the parts which serve as a joining object at a receptacle jig, the explanatory view in which drawing 7 shows the state at the time of ultrasonic machining, and drawing 8 are the explanatory views showing the cooling state on the surface of a product at the time of ultrasonic welding processing. Drawing 9 thru/or drawing 11 are the explanatory views showing each composition of another embodiment of the ultrasonic welding device concerning this invention.

[0016]First, the composition of the door trim 10 for cars which applies the ultrasonic welding method and welding device concerning this invention is explained based on drawing 1 and drawing 2, and the relation between the armrest 20 and the pull handle 30 is explained based on drawing 3.

[0017]So that the door trim 10 for cars may really stick the good epidermis material 12 of a feeling of a feel, and appearance design nature on the surface of the resin core material 11 fabricated by curved surface shape, and may be constituted so that it may illustrate, and especially a crew member may hang and rest an elbow, The central part of the door trim 10 is formed in the interior-of-a-room side in the shape of bulge, and the armrest 20 is attached to the upper surface of the bulged part 10a.

[0018]And the pull handle 30 is attached to this armrest 20, and by holding and operating this pull handle 30, it is constituted so that a door may be opened and closed with sufficient performance.

[0019]In detail the armrest 20 on the surface of the armrest core material 21 which consists of an injection-molding object of a synthetic resin A cloth sheet and a resin sheet, Or the armrest epidermis 22 which consists of a foaming resin sheet etc. is stuck, and this armrest 20 is engaged in a mounting hole in a clip with which illustration established a mounting hole on the upper surface of the bulged part 10a by which toughness was formed in the door trim 10, and the armrest core material 21 was equipped beforehand, and it is fixed.

[0020][ relation / between the armrest 20 and the pull handle 30 ] As shown in drawing 3, protrusion formation of the boss 23 for supersonic waves is carried out at two or more places of the back of the armrest core material 21 of the armrest 20, [ by the mounting hole's 32 being established by the periphery flange 31 of the pull handle 30 so that this boss 23 for supersonic waves may be inserted in, and intercalating the boss 23 for supersonic waves into the

mounting hole 32, and carrying out caulking processing of the tip of the boss 23 for supersonic waves ] The pull handle 30 is firmly attached to a back prescribed spot of the armrest 20.

[0021]By the way, before being able to use this invention method ideal for attachment of the pull handle 30 to the armrest 20 and explaining this invention method, composition of the ultrasonic welding device 40 applied to this invention based on drawing 4 and drawing 5 is explained.

[0022]Two or more ultrasonic horns 50 in which the ultrasonic welding device 40 concerning this invention is formed for every ultrasonic welding point, Comprise the receptacle jig 60 for setting the armrest 20 and the pull handle 30 in the parts and this embodiment used as an ultrasonic-machining object, and, [ the above-mentioned ultrasonic horn 50 ] It connects with the press device which is not illustrated, and predetermined stroke up-and-down motion is possible, predetermined pressure is applied to the product side, and thermofusion of the welding processing portion is carried out by vibration of the ultrasonic horn 50.

[0023]While the receptacle jig 60 is provided with the mold face shape which can set the armrest 20 in the shape of a fit, [ the jig ] The block-like aluminum radiator 70 is formed, the directly under portion, i.e., the ultrasonic-machining portion, of the ultrasonic horn 50, and the heat transmission of the heat generated at the time of ultrasonic welding is carried out to this aluminum radiator 70.

[0024]Although the cooling system 80 which cools this aluminum radiator 70 is formed, in this embodiment, the air supply pipe 81 which can supply the air for cooling to the aluminum radiator 70 was piped, and the air supply mouth 82 has attended the undersurface of the aluminum radiator 70. And the opening-and-closing valve 83 was formed in this air supply pipe 81, and it has connected with it with the air supply pump 84.

[0025]Many breakthroughs 71 used as the pass of the air for cooling from the air supply pipe 81 mentioned above are established along the up-and-down direction, and he is trying for the aluminum radiator 70 to, miss outside the heat which collected with the aluminum radiator 70 through this breakthrough 71 on the other hand, as shown in drawing 5.

[0026]Next, first, if this ultrasonic welding device 40 is used and the joining method of the armrest 20 and the pull handle 30 is explained, as shown in drawing 6, the armrest 20 will be set on the receptacle jig 60, and the pull handle 30 will be set on it. [ at this time ] [ the boss 23 for supersonic waves who provided in the armrest 20 ] It has inserted in in the mounting hole 32 of the pull handle 30, it is set so that the tip of the boss 23 for supersonic waves may turn to the

upper part, and it is set by the ROKETO means which was provided in the receptacle jig 60 and which is not illustrated so that the boss 23 for supersonic waves may be located in the directly under position of the ultrasonic horn 50.

[0027] And the ultrasonic horn 50 descends, if a set is completed, as shown in drawing 7, the oscillating heat from the ultrasonic horn 50 will be added at the tip of the boss 23 for supersonic waves, and caulking processing will be carried out, but. As the opening-and-closing valve 83 will be in an opened state, the air for cooling is supplied in the figure Nakaya seal direction from the air supply pipe 81 through the air supply pump 84 by the cooling system 80 at this time and it is shown in drawing 8, When air is supplied to the product surface side in an ultrasonic welding point through the breakthrough 71 provided in the aluminum radiator 70, popularity is won with the armrest epidermis 22 and heat distributes through the gap between the mold faces of the jig 60, Heat concentrates on an ultrasonic welding point like before, and a thermal damage is not added.

[0028] Therefore, while the textiles on the surface of a product in an ultrasonic welding point (armrest epidermis 22) do not carbonize, or not becoming solid [-like ] and being able to keep appearance appearance good, In order to secure welding strength, more some ultrasonic welding time can also be set up, moreover, not an expensive heat-resistant grade but a cheap material can be used as the armrest epidermis 22, and it can contribute also to the cost cut of a product.

[0029] Subsequently, drawing 9 thru/or drawing 11 are what shows the modification embodiment of the cooling system 80 for cooling the aluminum radiator 70, respectively, The hot blast passage 72 may be established in the aluminum radiator 70, and it may be made to establish an exit in receptacle jig 60 inside instead of the product side, as shown in drawing 9. In this case, the air for cooling supplied from the air supply pump 84 is introduced in the aluminum radiator 70 through the air supply pipe 81, and is discharged out of a mold through the hot blast passage 72. That is, the aluminum radiator 70 can be quickly cooled by carrying out heat transmission and eliminating the heat of the heated aluminum radiator 70 outside through the hot blast passage 72 from an ultrasonic welding processing point.

[0030] As shown in drawing 10, change to the air supply mouth 82, change to the air suction mouth 85 and the air supply pump 84, and the vacuum pump 86 is formed, The heat transmission of the heat generated in the product side is carried out to the aluminum radiator 70, it carries out degasification of the heat by which accumulation is carried out with this aluminum radiator 70 by the intake of the

vacuum pump 86, and it may be made to eliminate the heat of the aluminum radiator 70 outside at the time of ultrasonic welding.

[0031][ by forming the fin 73 for heat dissipation in the aluminum radiator 70, and making it face in the refrigerant passage 90 where refrigerants, such as air for cooling and an oil, circulate through this fin 73 for heat dissipation, as shown in [drawing 11](#)] The heat of the aluminum radiator 70 is transmitted to a refrigerant via the fin 73 for heat dissipation, and it may be made to cool the aluminum radiator 70.

[0032]Thus, as the cooling system 80 of the aluminum radiator 70, it is possible to adopt various composition.

[0033]

[Effect of the Invention]According to the ultrasonic welding method and welding device concerning this invention, as explained above. [ the heat generated when carrying out ultrasonic jointing of the parts by allocating an aluminum radiator in the receptacle jig corresponding to an ultrasonic welding point, and providing the cooling system which cools this aluminum radiator ] Since heat transmission is carried out to the aluminum radiator of a receptacle jig and an aluminum radiator is cooled by the cooling system, the product surface side does not receive a thermal damage on an ultrasonic welding point, the appearance appearance on the surface of a product is kept good, and it has the operation effect that a defect can be reduced sharply.

[0034]Since oscillating heat was prevented from concentrating on the product surface side in an ultrasonic welding point, while being able to secure many ultrasonic welding time and obtaining sufficient welding strength, It has the operation effect that the selection degree of freedom of material -- it changes to an expensive heat-resistant blade, and a cheap material can be used -- can also be raised sharply.

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#### [Brief Description of the Drawings]

[\[Drawing 1\]](#)It is a front view showing the door trim for cars which attached the armrest joined by this invention method, and the pull handle.

[\[Drawing 2\]](#)It is an II-II line sectional view in [drawing 1](#).

[\[Drawing 3\]](#)It is an explanatory view showing the relation of the armrest and pull handle in the door trim for cars shown in [drawing 1](#).

[\[Drawing 4\]](#)It is an explanatory view showing the whole one embodiment composition in the ultrasonic welding device concerning this invention.

[\[Drawing 5\]](#)It is an explanatory view showing the

composition of the portion near the aluminum radiator in the ultrasonic welding device shown in drawing 4.

[Drawing 6]It is an explanatory view showing the set process of the parts to the receptacle jig in this invention method.

[Drawing 7]It is an explanatory view showing the ultrasonic welding process in this invention method.

[Drawing 8]It is an explanatory view showing the cooling state of the aluminum radiator in this invention method.

[Drawing 9]It is an explanatory view showing the composition of another embodiment in the ultrasonic welding device concerning this invention.

[Drawing 10]It is an explanatory view showing the composition of another embodiment in the ultrasonic welding device concerning this invention.

[Drawing 11]It is an explanatory view showing the composition of another embodiment in the ultrasonic welding device concerning this invention.

[Drawing 12]It is a sectional view showing the composition of the conventional door trim for cars.

[Drawing 13]It is an explanatory view showing the conventional ultrasonic-machining method.

[Explanations of letters or numerals]

10 Door trim for cars

11 Resin core material

12 Epidermis material

20 Armrest

21 Armrest core material

22 Armrest epidermis

23 Boss for supersonic waves

30 Pull handle

32 Mounting hole

40 Ultrasonic welding device

50 Ultrasonic horn

60 Receptacle jig

70 Aluminum radiator

71 Breakthrough

72 Hot blast passage

73 Fin for heat dissipation

80 Cooling system

81 Air supply pipe

82 Air supply mouth

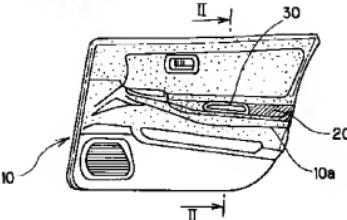
83 Opening-and-closing valve

84 Air supply pump

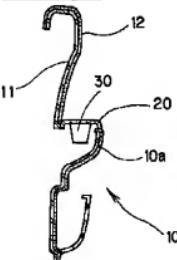
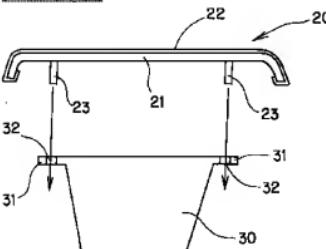
85 Air suction mouth

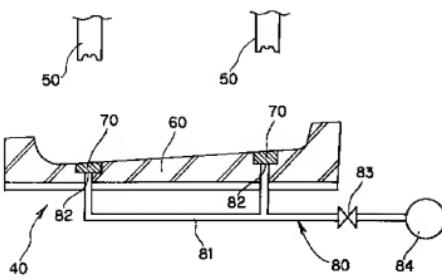
86 Vacuum pump

90 Refrigerant passage

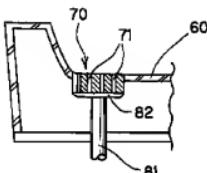
[Drawing 1]

10	自動車用ドアトリム	70	アルミ放熱体
11	樹脂芯材	71	貫通孔
12	表皮材	72	熱風通路
20	ームレスト	73	放熱用フィン
21	ームレスト芯材	80	冷却系
22	ームレスト表皮	81	エア供給管
23	超音波溶着装置	82	エア供給口
30	ブルハンドル	83	開閉バルブ
32	取付孔	84	エア供給ポンプ
40	超音波溶着装置	85	エア吸入口
50	超音波ホーン	86	真空ポンプ
60	受け治具	90	冷媒通路

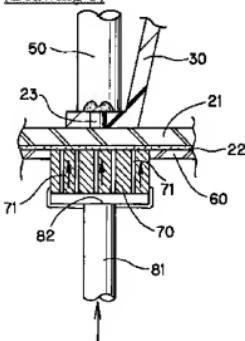
[Drawing 2][Drawing 3][Drawing 4]



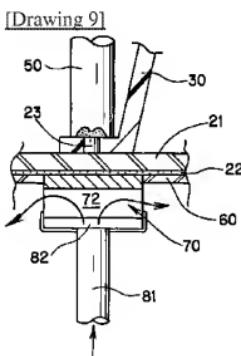
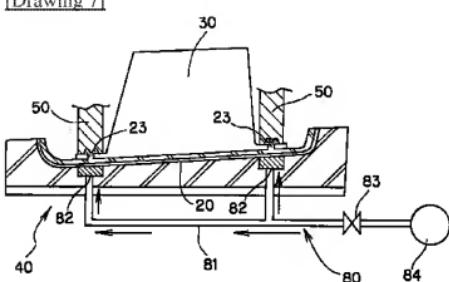
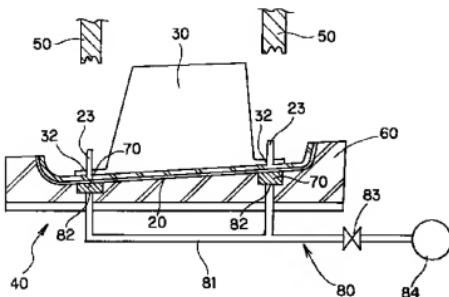
[Drawing 5]



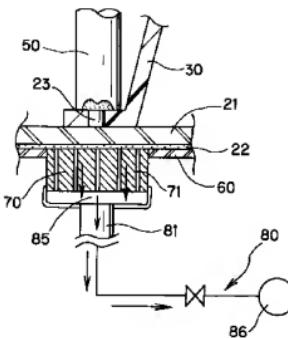
[Drawing 8]



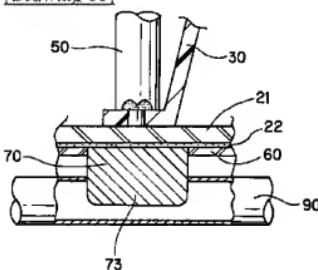
[Drawing 6]



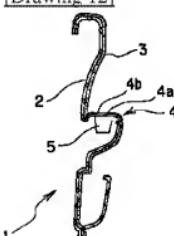
Drawing 10



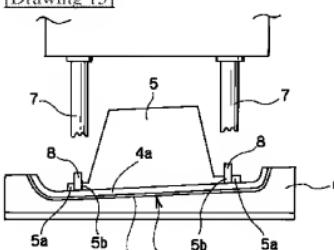
[Drawing 11]



[Drawing 12]



[Drawing 13]



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[Report Mistranslation](#)

[Japanese \(whole document in PDF\)](#)